



FOREST PEST MANAGEMENT

Pacific Southwest Region

37,89845 -119,94885

FPM Report No. C00-3

3420
June 15, 2000

Evaluation of White Pine Blister Rust on Sugar Pine in Granite Burn Plantations, Groveland Ranger District, Stanislaus National Forest

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INTRODUCTION/BACKGROUND

On May 11, 2000, a group of Forest Service personnel visited plantation #5-154 located at the intersection of Forest roads 1N04 and 2N24 (T.1N., R.18E., Sec. 36). Those present included:

Paul Zambino, Disease Resistance Screening Director, Placerville Nursery
John Kliejunas, Regional Plant Pathologist, RO
Lynn Webb, Acting Groveland District Silviculturist
Jim Junette, Silviculture Forester, Calaveras Ranger District
John Pronos, South Sierra Service Area Plant Pathologist

The 82-acre plantation is at an elevation of 5700 feet and was planted 24 years ago (prior to the current blister rust screening program) following the Granite Fire that occurred in 1973. Most other areas within the burn were planted almost exclusively with ponderosa pine, but this stand currently contains 57% sugar pine, 36% ponderosa pine and 13% giant sequoia. The average tree diameter at breast height (DBH) is 11.2 inches with an average height of 40 feet. The plantation is growing on an excellent site that has an R5 Site Class of 1.

Prescriptions are currently being written for thinning many of the stands within the Granite Burn. The objectives of our visit were to assess the status of white pine blister rust, assess the health of surviving sugar pine and discuss guidelines for retaining infected sugar pine.



SOUTH SIERRA SHARED SERVICE AREA
USDA Forest Service, Stanislaus National Forest
19777 Greenley Road, Sonora, California 95370

OBSERVATIONS/DISCUSSION

Many sugar pines were killed early on by blister rust on this site, and others are still dying. However, considering that the source of seed was not from known resistant parents, a surprising number of sugar pines are still alive after 24 years. Most pines show evidence of infections from several different years. Only two trees were found that were free of all infection.

Almost all infected trees had rust cankers at the base of the bole, which indicates infection at an early age. Rust cankers near the ground line on young trees would normally kill the tree in a few years. Additional cankers were present higher on the bole, plus trees had numerous branch cankers, both lethal and non-lethal.

We discussed why the surviving pines were still alive in spite of numerous infections that would normally be classified as lethal, based on their distance from the bole. Very few branch or bole cankers were sporulating, and the development of many bole cankers has slowed or stopped before they were able to girdle the stem and kill the pines. This suggests that these pines have genetic characteristics that limit the growth of the rust. This form of resistance is called "slow-rusting" and is quantitative and multigenic in nature, in contrast with single-gene "MGR" resistance. Also, because this is such a good site, the trees are growing very rapidly in diameter and height, which helps offset the effect of the rust.

THINNING GUIDES

In plantations like this, the general District policy is to favor sugar pine over ponderosa pine when thinning. Rust will continue to kill trees in these plantations. We found no pests on ponderosa pine, except for evidence of one annosus root disease center, and feel that in certain situations ponderosa pine should be favored over the most rust-susceptible sugar pine. However, the long-term survival of sugar pine will best be served by allowing sugar pines that were infected at an early age to continue to grow if they might survive to reproductive age (pollen production). Higher and more useful levels of resistance may be generated in the next generation of seedlings, if opportunities occur for slow-rusting genes from different trees to be combined.

Several factors should be considered when preparing prescriptions for these stands. Trees that are currently dying are the smallest trees in the plantation. Their growth has been stunted by rust infections in branches and bole. In most cases, sugar pines that are already at least 10" DBH should survive until they are 12" DBH.

Sugar pines that are candidates for removal include those that are not expected to survive for an additional 10 years because of girdling or breakage, as follows:

1. Trees with fading, off-color foliage.
2. The smallest, slowest-growing trees that have evidence of lethal rust cankers.
3. Trees with cankers that encompass more than 60% of the bole's circumference.
4. Trees which do not appear to be growing upright due to uneven bole growth at the site of canker(s) encompassing more than 50% of the bole's circumference.